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Capric (Decanoic) Acid
Final Registration Review Decision
Registration Review Case 5038

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Joan Harrigan-Farrelly, Director
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Date: 2/19/09

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Capric (Decanoic) Acid, Case 5038

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I. INTRODUCTION

This document is EPA's Final Registration Review Decision for Capric (Decanoic) Acid and is being issued pursuant to 40 CFR Sections 155.57 and 155.58. A registration review decision is the Agency's determination whether a pesticide meets, or does not meet, the standard for registration in the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). For additional information on Capric (Decanoic) Acid, additional documents can be found in EPA's public docket (EPA-HQ-OPP-2007-1040) at www.regulations.gov.

FIFRA, as amended by the Food Quality Protection Act (FQPA) of 1996, mandated the continuous review of existing pesticides. All pesticides distributed or sold in the United States must generally be registered by EPA, based on scientific data showing that they will not cause unreasonable risks to human health (including occupational and non-occupational exposures) or the environment when used as directed on product labeling. The new registration review program is intended to make sure that, as the ability to assess risk evolves and as policies and practices change, all registered pesticides continue to meet the statutory standard of no unreasonable adverse effects to human health or the environment. Changes in science, public policy, and pesticide use practices will occur over time. Through the new registration review program, the Agency periodically reevaluates pesticides to make sure that as change occurs, products in the marketplace can be used safely. Information on this program is provided at: http://www.epa.gov/oppsrrd1/registration_review/.

In 2006, the Agency implemented the Registration Review program pursuant to FIFRA Section 3(g) and will review each registered pesticide every 15 years to determine whether it continues to meet the FIFRA standard for registration.

Pursuant to 40 CFR Sec. 155.50, the Agency formally initiated registration review for Capric (Decanoic) Acid with the following timeline:

- December 2007 – publication of a Preliminary Work Plan (PWP) in the initial docket for Capric (Decanoic) Acid (EPA-HQ-OPP-2007-1040). During the 90 day comment period that closed on March 11, 2008, the Agency received no comments from the public.
- August 2008 – Issuance of a Final Work Plan and Proposed Registration Review Final Decision stating that the most recent exposure and risk assessments still supported the registration of pesticide products containing Capric (Decanoic) Acid and meet the requirements of registration review under 40 CFR Sec. 155.50. This document was issued for a 60-day public comment period; no comments were received.
- February 2009 – Issuance of a Final Registration Review Decision.

No comments were received on the Preliminary Work Plan (PWP), issued in December 2007, or the combined Final Work Plan and Proposed Registration Review Final Decision, issued in August 2008. The Agency is making its final decision on Capric (Decanoic) Acid based on no comments having been received and the low toxicity of Capric (Decanoic) Acid. In addition, the data and information evaluated to support Capric (Decanoic) Acid, case 5038, as published in the PWP dated December 12, 2007, continue to support this pesticide registration as

summarized herein. The status of these and other registration review cases is available on *http//www.epa.gov/oppsrrd1/registration review/ review*.

Capric (Decanoic) Acid, also referred to as decanoic acid, is an antimicrobial pesticide that is used as a food contact surface sanitizer in commercial food handling establishments. In addition, Capric (Decanoic) Acid is characterized by low toxicity, is biodegradable, and is found extensively in nature.

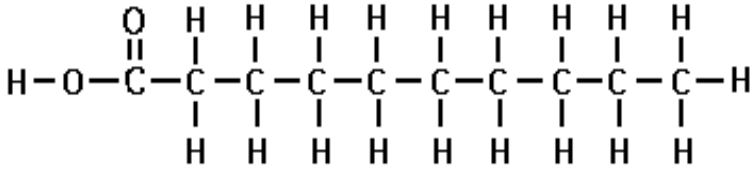
Currently, there are four registered products containing Capric (Decanoic) Acid as an active ingredient. This Registration Review of Capric (Decanoic) Acid addresses the Capric (Decanoic) Acid component of the registered products. The other active ingredients will be addressed during their subsequent Registration Review. Due to the products' registered uses on dairy and food-processing equipment such as tanks, vats, pails, pipelines and closed systems, there is the potential for residues in food; thus, Capric (Decanoic) Acid is considered to be a food-use chemical under the Federal Food, Drug, and Cosmetic Act (FFDCA). However, an exemption from the requirement of a tolerance for residues of Capric (Decanoic) Acid in foods has been established (40 CFR 180.1225).

II. SCIENTIFIC ASSESSMENT

A. Chemical Identification

Table 1 provides information on the chemical identity of Capric (Decanoic) Acid.

Table 1. Chemical Identity

Common Name	Capric (Decanoic) Acid
Chemical Name	n-Decanoic Acid
Molecular Weight	172.27
PC Code	128955
CAS Registry Number	334-48-5
Empirical Formula	$C_{10}H_{20}O_2$
Registration Review Case No.	5038
Chemical Structure: $CH_3(CH2)_8COOH$	 Capric Acid

B. Product Chemistry

Table 2 provides information on the physical and chemical properties of Capric (Decanoic) Acid. All product chemistry data requirements have been fulfilled for the active ingredient Capric (Decanoic) Acid; no additional data are needed at this time.

Table 2. Product Chemistry Data Summary for Capric (Decanoic) Acid

Guideline No.	Physical and Chemical Properties	Status	Value
830.1550	Product identity and composition	Acceptable	Refer to Table 1
830.1600	Description of materials used to produce the product	Acceptable	CBI
830.1620	Description of production process	Acceptable	CBI
830.1650	Description of formulation process	Acceptable	CBI
830.1670	Discussion of formation of impurities	Acceptable	CBI
830.1700	Preliminary analysis	Acceptable	CBI
830.1750	Certified limits	Acceptable	CBI
830.1800	Enforcement analytical method	Acceptable	Gas-Liquid Chromatography
830.1900	Submittal of samples	N/A	
830.6302	Color	Acceptable	White Crystals
830.6303	Physical State	Acceptable	Clear, Colorless Liquid White Crystalline Solid
830.6304	Odor	Acceptable	Unpleasant Musty, Rancid
830.6313	Stability to sunlight, normal and elevated temperature, metals/metal ions	Acceptable	Stable. Stable at room temperature in closed containers under normal storage and handling conditions. Presents no notable stability hazard other than low fire hazard (flash point = 270°F).
830.6314	Oxidation/Reduction: Chemical Incompatibility	Acceptable	Avoid strong oxidizing agents.
830.6315	Flammability	Acceptable	Flash Point: 112°C
830.6316	Explodability	Acceptable	Non-explodable
830.6317	Storage Stability	Acceptable	Stable at room temperature and no change in composition over the eighteen months storage.
830.6319	Miscibility	N/A	Not meant for dilution with petroleum solvents.
830.6320	Corrosion Characteristic	Acceptable	Non-corrosive
830.6321	Dielectric breakdown voltage	N/A	Not intended for use in or around electrical equipment.
830.7000	pH	Acceptable	Not soluble in water
830.7050	UV/Visible absorption	N/A	
830.7100	Viscosity	Acceptable	2.88 mPa.s at 70°C 4.30 mPa.s (cP) at 50°C (TOXNET)
830.7200	Melting Point	Acceptable	31.2 - 31.6°C
830.7220	Boiling point	Acceptable	270°C (760 mm Hg) 148-150°C (11 mm Hg)
830.7300	Density	Acceptable	1.02 gm/ml at 25°C (0.893 g/cm3) 0.8858 at 40°C

Guideline No.	Physical and Chemical Properties	Status	Value
830.7300	Specific Gravity	Acceptable	0.9
830.7370	Dissociation Constants in water	Acceptable	Not determined due to lack of solubility in water. 4.90 (TOXNET)
830.7550	Octanol/water partition coefficient	Acceptable	This active ingredient is a non-polar organic substance. Log Kow: 4.09 (EPI Suite)
830.7840	Solubility in water (g/100ml)	Acceptable	0.015 gm/l00gm at 20°C 0.15 g/liter (20°C) Practically insoluble in water
830-xxxx	Solubility in organic solvents		Acetone (20°C) = 407 gm/l00gm Isopropanol (20°C) = 360 gm/l00gm Methanol (20°C) 510 gm/l00gm n-hexane (20°C) = 290 gm/l00gm Soluble in alcohol and ether.
830.7950	Vapor pressure	Acceptable	Not Applicable. Melting point greater than 30°C. 0.00878 mm Hg (EPI Suite) Less than 1 mm Hg at 72°F 0.13 hPa @ 79°C
	Hazardous Decomposition Products		Does not decompose up to 400°F
	Hazardous Polymerization		Does not occur
Other Physical/Chemical Properties			
	Classification of a.i.		Aliphatic hydrocarbon Carboxylic acid
	Henry's Law Constant at 25°C		1.342E-006 atm-m3/mole (EPI Suite)
	Koc		Estimated Koc: 87.2 (EPI Suite) Log Koc: 1.9403 (EPI Suite)
	Ready Biodegradability Prediction		Yes (EPI Suite) Microbiological degradation.
	Hydrolysis		No hydrolysis
	Log BCF		Log BCF = 0.500 (EPI suite) BCF=3.162 (EPI suite)
	Refractive Index		1.4569 (20°C)

C. Human Health Risk Assessment Status

1. Toxicology

The Agency does not have formal guideline toxicology studies for Capric (Decanoic) Acid. The information presented herein has been gathered from the open scientific literature.

a. Acute Toxicity

From the BIBRA Information Services Ltd. (http://www.bibra-information.co.uk/) Toxicity Profile for Capric (Decanoic) Acid, the acute oral toxicity is low (LD_{50} >10 g/kg) as is the acute dermal toxicity (LD_{50} >5 g/kg). Capric (Decanoic) Acid is a moderate to severe skin

irritant when applied undiluted to intact or abraded rabbit skin for 24 hours. Capric (Decanoic) Acid is also a severe eye irritant when applied as a 5% solution.

b. Subchronic and Chronic Toxicity

As reported in Patty's Industrial Hygiene and Toxicology, 4th ed., rats fed Capric (Decanoic) Acid at 10% in the diet for 150 days showed no adverse effects from treatment. In a study by Renaud et al. (Journal of Nutrition, Vol. 90, 1966, p. 453) rats administered approximately 4 g Capric (Decanoic) Acid/kg/day for 6 weeks showed reduced body weight gain and increased plasma triglyceride levels. In a longer term study in which rats were fed 2.5 g/kg/day Capric (Decanoic) Acid for 47 weeks, no abnormalities of the cellular structure of the liver or intestine were noted. Dogs administered 4.4 g/kg/day Capric (Decanoic) Acid for 102 days showed no adverse effects from treatment.

In another study by Hendrich et. al., (JAOCS, Vol. 70, no. 8, August 1993, pages 797-802), CBA/2 and C57B1/6 mice were fed *Cuphea* oil containing 76% Capric (Decanoic) Acid. The control diet contained beef tallow, and the *Cuphea* oil diet substituted for half of the beef tallow in the experimental diet. Although the study design is not very clear, it appears that parental animals were fed for various times due to the short supply of *Cuphea* oil. C57B1/6 mice were fed for either 10 months, 8 months, or 5 months (F1, F2, and F3 generations), while the CBA/2 mice were fed for 11-12 months, 9-11 months, and 6-8 months (F1, F2, and F3 generations). Body weights, food intake, liver weights, and total serum cholesterol were analyzed as well as the number of pups born and surviving to weaning. Histopathology was performed on liver, left kidney, spleen, heart, lung, and one testis. The histopathology appears to have been done only on parental mice. Feeding of *Cuphea* oil containing Capric (Decanoic) Acid to successive generations of two strains of mice did not appear to affect reproductive parameters. There was an unexplained drop in the number of pups surviving to weaning in the F1 and F2 generations for both strains of mice. Body weight in C57B1/6 and CBA/2 mice was reduced approximately 10% after 13 weeks of treatment but this effect was not observed in successive generations. Food intake was not consistently affected by treatment. Serum cholesterol was significantly increased in C57B1/6 mice after 3 months of treatment, and the increase was also observed after 5 and 12 months. Fatty vacuolization was observed in the liver of most mice after treatment. CBA/2 mice tended to accumulate fat as large vacuoles in periportal hepatocytes with smaller vacuoles in centrilobular hepatocytes. C57B1/6 mice had a more diffuse fatty change with large vacuoles in centrilobular areas.

c. Carcinogenicity

There are no available data on carcinogenicity of Capric (Decanoic) Acid. However, available mutagenicity data (Negishi and Hayatsu, Mut. Res. 135: 87-96, 1984) show Capric (Decanoic) Acid inhibits N-nitrosodimethylamine induced mutagenesis by virtue of its antimicrobial activity.

d. Physiological Effects

Capric (Decanoic) Acid was observed to enhance the permeability of the blood-brain barrier in Wistar rats to several hydrophilic compounds when administered into the carotid artery (Ohnishi et al., J. Pharm. Pharmacol. 51: 1015-1018, 1998).

e. Endocrine Effects

The Agency is required under section 408(p) of the Federal Food, Drug and Cosmetic Act (FFDCA), as amended by FQPA, to develop a screening program to determine whether certain substances (including all pesticide active and other ingredients) "may have an effect in humans that is similar to an effect produced by a naturally-occurring estrogen, or other such endocrine effect as the Administrator may designate." Following the recommendations of its Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC), EPA determined that there was a scientific basis for including, as part of the program, androgen and thyroid hormone systems, in addition to the estrogen hormone system. EPA also adopted EDSTAC's recommendation that it include evaluations of potential effects in wildlife. The Agency does not have any information with respect to potential endocrine effects of Capric (Decanoic) Acid in mammalian systems. There is no information from the available scientific literature to suggest that this fatty acid would have endocrine effects.

The Agency has no knowledge of Capric (Decanoic) Acid being an endocrine disruptor. When the appropriate screening and/or testing protocols being considered under the Agency's Endocrine Disrupter Screening Program (EDSP) have been developed and vetted, Capric (Decanoic) Acid may be subjected to additional screening and/or testing to better characterize effects related to endocrine disruption.

Although the toxicity data base for Capric (Decanoic) Acid is limited, the toxicity profile indicates no significant systemic toxicity even at high dose levels. Therefore, a quantitative assessment is not being conducted and no human health toxicity endpoints for the active ingredient Capric (Decanoic) Acid have been selected. The Agency does not anticipate the need for additional toxicity or exposure data for Capric (Decanoic) Acid.

2. Dietary, Drinking Water, Residential and Occupational Exposure

a. Dietary Exposure

An exemption from the requirement of a tolerance for residues has been established in 40 CFR 180.1225 and 40 CFR 180.940 (b) and (c) because no adverse systemic effects attributable to oral exposure have been identified. Based on the registered uses as a sanitizer on dairy equipment and in food processing equipment such as tanks, vats, pails, pipelines and closed systems, minimal dietary exposure is expected to occur from Capric (Decanoic) Acid use. Therefore, dietary exposure and risk will not be assessed for Capric (Decanoic) Acid when used as a food contact surface sanitizer.

b. Drinking Water Exposure

As all registered use sites are indoors, no dietary exposure from drinking water is expected to occur from residential wells or municipal sources. However, there is a possibility that the use of Capric (Decanoic) Acid as a surface sanitizer in water bottling plants may result in the occurrence of low concentrations in bottled drinking water. Because of the low toxicity associated with Capric (Decanoic) Acid, and the existing tolerance exemptions, the risk of dietary exposure from drinking water is not of concern.

c. Residential and Occupational Exposure

Based on the registered uses of Capric (Decanoic) Acid as a food contact surface sanitizer in food handling establishments, no potential residential exposure is anticipated. Because of the low toxicity of Capric (Decanoic) Acid, adverse effects from Capric (Decanoic) Acid are not expected. Occupational exposure to workers who mix, load, and apply Capric (Decanoic) Acid is expected; however, a risk assessment is not needed based on the low toxicity.

D. Environmental Fate and Ecological Effects Exposure and Risk Assessment Status

1. Environmental Fate

An environmental fate assessment has not been conducted for Capric (Decanoic) Acid. Capric (Decanoic) Acid is classified as a saturated fatty acid, a group of substances which is completely biodegradable and found extensively in nature. Specifically, Capric (Decanoic) Acid occurs in a number of plants, and animal sources such as animal oils, fats, butter, coconut oil, etc. It is a food-grade substance, non-volatile and relatively inert to aqueous hydrolysis. It is a minimal risk and low concern inert, a normal constituent in animal diet and is readily metabolized by all forms of life. Microorganisms rapidly degrade fatty acids in soil. Thus, the Agency does not anticipate the need for a down-the-drain assessment and does not anticipate risks of concern to wastewater treatment plants (WWTPs).

2. Ecological Effects

The Agency has conducted a review of the scientific databases and other relevant information supporting the reregistration of Capric (Decanoic) acid, and has waived all generic data requirements for this chemical. Capric (Decanoic) acid is listed as Generally Recognized as Safe (GRAS) food additive by the Food and Drug Administration (21 CFR 172.863; as food additives permitted for direct addition to food for human consumption). Fatty acids normally are metabolized, forming simple compounds that serve as energy sources and structural components used in all living cells. Capric (Decanoic) Acid ($C_{10}H_{20}O_2$) is structurally similar to Lauric acid ($C_{12}H_{24}O_2$), Myristic acid ($C_{14}H_{28}O_2$), Oleic acid ($C_{18}H_{34}O_2$) and Ricinoleic acid ($C_{18}H_{34}O_3$) except for the different carbon chain length.

3. Endangered Species

As mentioned previously, Capric (Decanoic) Acid has low toxicity. There are four products registered for pesticidal use; these products are registered for indoor use and have a low percentage of this active ingredient in the end use product (≤3% ai). In addition, Capric (Decanoic) Acid is classified as a saturated fatty acid, a group of substances which is completely biodegradable and found extensively in nature. It is naturally occurring in vegetable oils and in animal fats and is a significant part of the normal diets of mammals, birds and invertebrates; it is readily metabolized by all forms of life.

Capric (Decanoic) Acid is not expected to contaminate ground water or soil and does not accumulate in the food chain. Because of the rapid degradation of Capric (Decanoic) Acid into components that do not pose a risk to aquatic organisms, the Agency is not conducting a down-the-drain assessment.

Based on rapid decomposition, indoor use patterns, no-to-extremely low environmental exposure potential, and low toxicity, the Agency has determined that the registered uses of Capric (Decanoic) Acid will have "no effect" (NE) on endangered or threatened terrestrial or aquatic species, or their designated critical habitats, as listed by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA).

E. Incidents

Federal law requires registrants of pesticides to inform EPA about any harmful effects of their products. There are 8 incidents for products containing Capric (Decanoic) Acid that were found during a search of the OPP Incident Data System (IDS), containing data collected from 1992-present. These incidents reported that exposure caused minor to moderate irritation reactions. Dermal and eye exposure caused rash, redness, pain, diarrhea, chemical burns, corneal abrasion, heavy breathing, headache, dizziness, vertigo, vomiting, and swelling esophagus. Oral ingestion caused abdominal pain and throat discomfort.

It should be noted that each product currently registered containing Capric (Decanoic) Acid contains at least one other active ingredient in higher concentration. At least one other active ingredient in every implicated Capric (Decanoic) Acid-containing end-use product is expected to be more severely irritating than Capric (Decanoic) Acid, especially at the concentrations formulated. Based on the low number of incidents reported for products containing Capric (Decanoic) Acid, and the low toxicity of Capric (Decanoic) Acid, the Agency believes that these incident reports may not indicate a specific Capric (Decanoic) Acid-related cause.

F. Public Comments

Pursuant to 40 CFR Sec. 155.50, the Agency formally initiated registration review for Capric (Decanoic) Acid on December 12, 2007 with the opening of a docket and the issuance of a PWP for public comment. The Agency received no comments concerning the Preliminary

Work Plan for Capric (Decanoic) Acid during its 90-day public comment period. The Agency also received no comments concerning the Combined Final Work Plan and Proposed Registration Review Final Decision document issued for a 60-day public comment period on August 29, 2008.

G. Environmental Justice

EPA seeks to achieve environmental justice - the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income - in the development, implementation, and enforcement of environmental laws, regulations, and policies. At this time EPA does not believe that use of pesticide products containing Capric (Decanoic) Acid will cause harm or a disproportionate impact on at-risk communities. In the Preliminary Work Plan dated December 12, 2007, the Agency sought comment on environmental justice issues regarding Capric (Decanoic) Acid. As mentioned previously, no comments were received.

For additional information regarding environmental justice issues, please visit EPA's website at: http://www.epa.gov/compliance/environmentaljustice/index.html.

H. Water Quality

Capric (Decanoic) Acid is not identified as a cause of impairment for any water-bodies listed as impaired under section 303(d) of the Clean Water Act, based on information provided at: http://oaspub.epa.gov/tmdl/waters_list.impairments?p_impid=3. The Agency sought submission of water quality information for Capric (Decanoic) Acid when the Preliminary Work Plan was issued for comment. The Agency did not receive any comments on water quality issues.

I. Trade Irritants

Through the registration review process, the Agency solicited information on trade irritants and, to the extent feasible, took steps toward facilitating irritant resolution. Growers and other stakeholders were asked to comment on any trade irritant issues resulting from lack of Maximum Residue Levels (MRLs) or disparities in key export markets, providing as much specificity as possible regarding the nature of the concern. In the case of Capric (Decanoic) Acid, there are indirect food uses as Capric (Decanoic) Acid is registered for use as a contact surface sanitizer in commercial food handling establishments. In addition, an exemption from the requirement of a tolerance for residues has been established in 40 CFR 180.1225 and 40 CFR 180.940 (b) and (c). Additionally, there are no MRLs established for Capric (Decanoic) Acid. The Agency did not receive and comments regarding the existence of any trade irritant issues associated with Capric (Decanoic) Acid.

III. FINAL REGISTRATION REVIEW DECISION

The Agency has determined that no additional data are required at this time to support the registration of Capric (Decanoic) Acid. The Agency has considered Capric (Decanoic) Acid in light of the standard for registration and safety factors in FIFRA and FFDCA as amended by FQPA. EPA has found that there are not likely to be any unreasonable adverse effects to the U.S. population in general, and to infants and children in particular, or to non-target organisms or the environment, from the use of registered pesticide products containing Capric (Decanoic) Acid when currently required label instructions are followed. The Agency has found that it is not necessary to conduct a new risk assessment for this case and is therefore issuing a proposed final decision pursuant to 40 CFR 155.53 (c)(2) and 40 CFR 155.58.

As per 40 CFR Sections 155.57 and 155.58, the Agency determined that the standards for Registration Review have been met, and the registrations of the aforesaid Capric (Decanoic) Acid products may be maintained.

IV. NEXT STEPS AND TIMELINE:

Pursuant to 40 CFR Section 155.58**,** this Final Registration Review Decision document is being entered into the Capric (Decanoic) Acid docket (EPA-HQ-OPP-2007-1040). The Final Work Plan is also included in this document. A Federal Register Notice will announce the availability of the Final Registration Review Decision.

V. GLOSSARY of TERMS & ABBREVIATIONS

ai	Active Ingredient
AR	Anticipated Residue
ASTM	American Society for Testing and Materials
AWPA	American Wood Preserver's Association
CFR	Code of Federal Regulations
cPAD	Chronic Population Adjusted Dose
CSF	Confidential Statement of Formula
CSFII	USDA Continuing Surveys for Food Intake by Individuals
DCI	Data Call-In
DEEM	Dietary Exposure Evaluation Model
DFR	Dislodgeable Foliar Residue
DNT	Developmental Neurotoxicity
DWLOC	Drinking Water Level of Comparison
EC	Emulsifiable Concentrate Formulation
EDWC	Estimated Drinking Water Concentration
EEC	Estimated Environmental Concentration
EPA	Environmental Protection Agency
EUP	End-Use Product
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FFDCA	Federal Food, Drug, and Cosmetic Act
FQPA	Food Quality Protection Act
FOB	Functional Observation Battery
GENEEC	Tier I Surface Water Computer Model
IR	Index Reservoir
LC_{50}	Median Lethal Concentration. A statistically derived concentration of a substance that can be expected to cause death in 50% of test animals. It is usually expressed as the weight of substance per weight or volume of water, air or feed, e.g., mg/l, mg/kg or ppm.
LD_{50}	Median Lethal Dose. A statistically derived single dose that can be expected to cause death in 50% of the test animals when administered by the route indicated (oral, dermal, inhalation). It is expressed as a weight of substance per unit weight of animal, e.g., mg/kg.
LOC	Level of Concern
LOAEL	Lowest Observed Adverse Effect Level
µg/g	Micrograms Per Gram
µg/L	Micrograms Per Liter
mg/kg/day	Milligram Per Kilogram Per Day
mg/L	Milligrams Per Liter
MOE	Margin of Exposure
MRID	Master Record Identification (number). EPA's system of recording and tracking submitted studies.
MUP	Manufacturing-Use Product
NA	Not Applicable
NAWQA	USGS National Ambient Water Quality Assessment
NPDES	National Pollutant Discharge Elimination System
NR	Not Required
NOAEL	No Observed Adverse Effect Level
OPP	EPA Office of Pesticide Programs
OPPTS	EPA Office of Prevention, Pesticides and Toxic Substances
PAD	Population Adjusted Dose
PAIRA	Pure Active Ingredient Radiolabelled
PCA	Percent Crop Area
PDP	USDA Pesticide Data Program

PHED	Pesticide Handler's Exposure Data
PHI	Preharvest Interval
ppb	Parts Per Billion
PPE	Personal Protective Equipment
ppm	Parts Per Million
PRZM/EXAMS	Tier II Surface Water Computer Model
Q_1*	The Carcinogenic Potential of a Compound, Quantified by the EPA's Cancer Risk Model
RAC	Raw Agriculture Commodity
RED	Reregistration Eligibility Decision
REI	Restricted Entry Interval
RfD	Reference Dose
RQ	Risk Quotient
SCI-GROW	Tier I Ground Water Computer Model
SAP	Science Advisory Panel
SF	Safety Factor
SLN	Special Local Need (Registrations Under Section 24©) of FIFRA)
TGAI	Technical Grade Active Ingredient
TEP	Typical End-Use Product
USDA	United States Department of Agriculture
UF	Uncertainty Factor
WPS	Worker Protection Standard